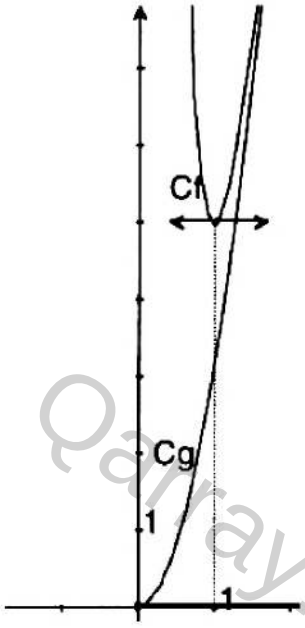
$\lim_{+\infty} \frac{f(x)}{x} = \lim_{+\infty} \frac{g(x)}{x} = +\infty$

(ζ_f) et (ζ_g) admettent chacune d'elles une branche infine parabolique de direction celle de $(O,\vec{j})$

Rq: f(x)>g(x) ; $\forall x \in]0,+\infty[$



2) □si $\lambda \geq 1$

$$A(\lambda)=\int_1^{\lambda}(f(x)-g(x))dx=\int_1^{\lambda}\frac{2}{x^3}dx$$

□si $0<\lambda<1$

$$A(\lambda)=\int_{\lambda}^{1}(f(x)-g(x))dx=\int_{\lambda}^{1}\frac{2}{x^3}dx=-\int_1^{\lambda}\frac{2}{x^3}dx$$

d'où $A(\lambda)=\left|\int_1^{\lambda}\frac{2}{x^3}dx\right|$ car $A(\lambda)\geq 0$

$$A(\lambda)=\left|\int_1^{\lambda}\frac{2}{x^3}dx\right| = A(\lambda)=\left|\left[\frac{-1}{x^2}\right]_1^{\lambda}\right|=\left|1-\frac{1}{\lambda^2}\right|$$

b) $\begin{cases} A(\lambda)=\frac{1}{\lambda^2}-1 & \text{si } 0<\lambda<1 \\ A(\lambda)=1-\frac{1}{\lambda^2} & \text{si } \lambda \geq 1 \end{cases}$

□ dérivabilité en 1 :

$$\lim_{\lambda\to 1^-}\frac{A(\lambda)-A(1)}{\lambda-1}=\lim_{\lambda\to 1^-}\frac{-(1+\lambda)}{\lambda^2}=-2$$

$$\lim_{\lambda\to 1^+}\frac{A(\lambda)-A(1)}{\lambda-1}=\lim_{\lambda\to 1^+}\frac{1+\lambda}{\lambda^2}=2$$

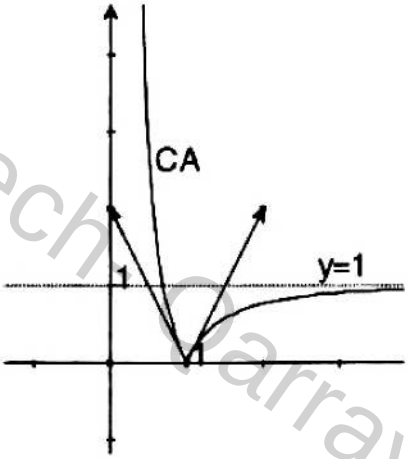
le point I(1,0) est un point anguleux

$\begin{cases} A'(\lambda=\frac{-2}{\lambda^3} & \text{si } 0<\lambda<1 \\ A'(\lambda)=\frac{2}{\lambda^3} & \text{si } \lambda>1 \end{cases}$

$$\lim_{\lambda\to+\infty}A(\lambda)=\lim_{\lambda\to+\infty}(1-\frac{1}{\lambda^2})=1$$

$$\lim_{\lambda\to 0^+}A(\lambda)=+\infty$$

λ	0		1		+∞
A'(λ)	‖	-	‖	+	
A(λ)	‖ +∞	↘	0	↗	1



c) □si : $m \in]-\infty,0[$

l'équation : $A(\lambda)=m$ n'a pas de solutions

□si : $m \in \{0\} \cup [1,+\infty[$: une seule solutions

□si : $m \in]0,1[$: deux solutions

Qarray.tn -Aqra Blech- Qarray.tn